

# **Sure-Weld® TPO**

## **Roofing Systems**

### **GUIDE - SPEC**

#### **Sure-Weld® Fully ADHERED ROOFING SYSTEM**

January 2024

This **GUIDE-SPEC** is a brief outline of Carlisle's Sure-Weld Fully Adhered Roofing System requirements and is intended for use as a submittal document to compliment a contractor's bid package. Specifiers and Carlisle Authorized Roofing Applicators must reference and comply with applicable information contained within the current Carlisle Thermoplastic Roofing System Specification prior to design or bid of a project.

#### **PART I GENERAL**

##### **1.01 DESCRIPTION**

**The Sure-Weld Adhered Roofing System** incorporates maximum 12' wide white, gray or tan 45, 60 or 80-mil thick scrim-reinforced Sure-Weld Thermoplastic Polyolefin (TPO) membrane (also available in special colors in 60-mil thick, maximum 10' wide sheets). The Spectro-Weld™ Adhered Roofing System incorporates 10' wide, white, 60 or 80-mil thick scrim-reinforced Thermoplastic Polyolefin (TPO) membrane field sheets. Carlisle Insulation is mechanically fastened to the roof deck or secured with Flexible FAST™ Adhesive, OlyBond 500 BA, or OlyBond Spot Shot Adhesive and the membrane is fully adhered to the insulation with the appropriate Sure-Weld Bonding Adhesive. Adjoining sheets of membrane are overlapped approximately 2" and joined together with a minimum 1-1/2" wide heat weld.

##### **1.02 QUALITY ASSURANCE**

- A. The specified roofing system must be installed by a Carlisle Authorized Roofing Applicator in compliance with drawings and specifications as approved by Carlisle SynTec.
- B. Upon request, an inspection shall be conducted by a Field Service Representative of Carlisle to ascertain that the membrane roofing system has been installed according to Carlisle's published specifications and details applicable at the time of bid. This inspection is to determine whether a warranty shall be issued. It is not intended as a final inspection for the benefit of the owner.
- C. For specific code approvals achieved with this system, refer to Carlisle's Sure-Weld Code Approval Guide, DORA (Directory of Roof Assemblies), FM Approvals or UL Fire Resistance Directory for Roofing Materials and Systems.

##### **1.03 SUBMITTALS**

- A. To ensure compliance with Carlisle's minimum warranty requirements, the following projects should be forwarded to Carlisle for review prior to installation, preferably prior to bid.
  - 1. Air pressurized buildings, canopies, and buildings with large openings, cold storage buildings or freezer facilities, projects over 250' in height or projects where the membrane is expected to come in direct contact with petroleum-based products, waste products (i.e., grease, oil, animal fats, etc) and other chemicals.
- B. Shop drawings must be submitted to Carlisle by the Carlisle Authorized Roofing Applicator along with a completely executed Notice of Award (Page 1 of Carlisle's Request For Warranty form) for approval. Approved shop drawings are required for inspection of the roof and on projects where on-site technical assistance is requested.

##### **1.04 GENERAL DESIGN CONSIDERATIONS**

- A. It is the responsibility of the building owner or his/her designated representative to verify structural load limitation. In addition, a core cut may be taken to verify weight of existing components when the roofing system is to be specified on an existing facility.
- B. On new construction projects, especially in cold climate regions, moisture generated due to the construction process could adversely impact various components within the roofing assembly if not addressed. [Refer to Design References DR-01-21 "Construction Generated Moisture" included in the Carlisle Technical Manual]



- C. On structural concrete decks, when a vapor retarder is not used, gaps in the deck along the perimeter and around penetrations must be sealed along with vertical joints between tilt-up panels, if present, to prevent infiltration of hot humid air and possible moisture contamination resulting from condensation. This is specifically important when adhesive is used to attach the roof insulation.

**CAUTION:** If left unaddressed, collected moisture could weaken insulation boards and facers resulting in a blow-off or increase the probability of mold growth.

D. Vapor Retarders

1. Carlisle does not require a vapor retarder for the protection of the membrane; however, it should be considered by the specifier for the protection of the roofing assembly (i.e. primarily insulation, underlayment and adhesives). The following criteria should be considered by the specifier:
  - a. Use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly, should be investigated by the specifier.
  - b. In the generally temperate climate of the United States, during the winter months, water vapor flows upward from a heated, more humid interior towards a colder, drier exterior. Vapor retarders are more commonly required in northern climates than in southern regions, where downward vapor pressure may be expected and the roofing membrane itself becomes the vapor retarder.

## 1.05 WARRANTY

**Table I Adhered Membrane Systems Warranty Options**

Years	Thermoplastic Membranes (Sure-Weld TPO)				
	55, 72, 80 or 90 mph	100 mph	110 to 120 mph	Minimum Membrane Thickness	Additional Puncture Coverage (1)
	Adhered	Adhered	Adhered		
5,10, or 15 year	√(2)	√	√	Sure-Weld 45-mil	Not Available - 80-mil Membrane Required
20 year	√	√	√	Sure-Weld 60-mil (3)	Not Available - 80-mil Membrane Required
25 year	√	√	N/A	Sure-Weld 80-mil (4)	Available – See Below
30 year	√	√	N/A	Sure-Weld 80-mil (4)	Available – See Below

Notes:

N/A = Not Acceptable

√= Acceptable

- (1) Limits of Hail/Puncture Coverage to be defined by other Tables.
- (2) Water based adhesive may be used for projects with 15 year maximum warranty and wind speed coverage up to 55 mph.
- (3) Spectro-Weld OR Sure-Weld SAT TPO 60-mil membranes may be used in lieu of Sure-Weld 60-mil membrane.
- (4) Spectro-Weld 80-mil membrane can be used in lieu of Sure-Weld 80-mil membrane. Sure-Weld 80-mil TPO in Special Colors are limited to Warranties Up to 20 Year.

### Sure-Weld TPO Membrane

#### Hail

- 1" Dia. Hail Coverage requires a minimum of 60-mil TPO Adhered to cover board.
- 2" Dia. Hail Coverage requires 80-mil TPO Adhered to cover board.

#### Additional Design Requirement:

- Cover board (SecurShield HD, SecurShield HD Plus, SecurShield HD or StormBase Composite, DensDeck Prime, or Securock – Adhered Only).

#### Puncture

- Minimum 80-mil TPO Adhered or Mechanically Fastened.

## 1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the original, unopened containers labeled with the manufacturer's name, brand name and installation instructions.
- B. Store Sure-Weld membrane in original undisturbed plastic wrap.
- C. Job site storage temperatures in excess of 90° F may affect shelf life of curable materials (i.e., adhesives and sealants).
- D. When liquid adhesives and sealants are exposed to lower temperatures, restore to a minimum of 60° F before use.

### **1.07 JOB CONDITIONS**

- A. Refer to Carlisle Technical Manual for applicable project specific Job Conditions.

## **PART II PRODUCTS**

### **2.01 GENERAL**

The components of this roofing system are to be products of Carlisle or accepted by Carlisle as compatible. The installation, performance or integrity of products by others, **when selected by the specifier and accepted by Carlisle**, is not the responsibility of Carlisle and is **expressly disclaimed** by the Carlisle Warranty.

### **2.02 MEMBRANE**

Sure-Weld white, gray or tan 45, 60, or 80-mil thick reinforced Thermoplastic Polyolefin (TPO) membrane is used for this system. Field membrane sheets are 12', 10' or 8' wide by 100' long based on project conditions. Perimeter sheets are 6' wide (used with 12' or 10' field sheets), or 4' wide (used with 8' field sheets).

### **2.03 RELATED MATERIALS**

Sure-Weld Non-Reinforced or Reinforced Flashing, Standard and Low-VOC Bonding Adhesive, Pressure Sensitive Cover Strip, TPO Pressure Sensitive R.U.S.S., TPO T-Joint Covers, Cut Edge Sealant, Water Cut-Off Mastic, Universal Single Ply Sealant, Weathered Membrane Cleaner, Standard and Low-VOC Primers, One Part Pourable Sealer, Pre Molded Accessories, Heat Weldable Walkway Rolls and LIQUISEAL Liquid Flashing.

## **PART III EXECUTION**

### **3.01 GENERAL**

- A. When feasible, begin the application at the highest point of the highest roof level and work to the lowest point to prevent moisture infiltration and minimize construction traffic on completed sections. This will include completion of all flashings and terminations.

### **3.02 ROOF DECK CRITERIA**

- A. A proper substrate shall be provided by the building owner. The structure shall be sufficient to withstand normal construction loads and live loads.
- B. Defects in the roof deck must be reported and documented to the specifier, general contractor and building owner for assessment. The Carlisle Authorized Roofing Applicator shall not proceed unless the defects are corrected.
- C. Refer to Carlisle Technical Manual for acceptable decks and the applicable Carlisle Fasteners (when mechanical attachment of insulation is specified).

### **3.03 SUBSTRATE REQUIREMENTS**

- A. Acceptable Carlisle insulations include all types currently approved with Design "A" Adhered Roofing Systems.
- B. The substrate must be dry, relatively smooth, free of protrusions, debris, sharp edges or foreign materials and must be free of accumulated water, ice and snow. Cracks or voids in the substrate greater than 1/4" must be filled with Flexible FAST Adhesive or other suitable material.
- C. On retrofit-recover projects, cut and remove wet insulation as identified by the specifier and fill all voids with new insulation, so that it is relatively flush.

### 3.04 INSTALLATION

Refer to the applicable Safety Data Sheets and Technical Data Bulletins for cautions and warnings.

#### A. Insulation Attachment

1. Carlisle Flexible FAST Adhesive may be specified for insulation securement in full spray or beads with spacing as outlined in the Carlisle Technical Manual.
2. Carlisle Fasteners may be used, when specified, to secure Carlisle Insulation at the specified density outlined in the Carlisle Technical Manual.

#### B. Membrane Installation and Hot Air Welding

1. Sweep loose debris from the substrate.
2. Position Sure-Weld Membrane over acceptable substrate and fold membrane back so half the underside is exposed.
3. Apply the applicable Carlisle Bonding Adhesive to the exposed underside of the membrane and the corresponding substrate area with a plastic core medium nap paint roller at the published application rate on the applicable Product Data Sheet.
4. Allow adhesive to dry until tacky and roll coated membrane into coated substrate and avoid wrinkling.
5. Brush down the bonded section of membrane immediately with a soft bristle push broom.
6. Fold back the un-bonded half of the sheet and repeat the bonding procedure.
7. Install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2" to provide for a minimum 1-1/2" hot air weld. It is recommended that all splices be shingled to avoid bucking of water.
8. Hot air weld the membrane sheets a minimum of 1-1/2" with an Automatic Hot Air Welding Machine.
9. Membrane that has been exposed to the elements for approximately 7 days must be prepared with Weathered Membrane Cleaner. Wipe the surface where Weathered Membrane Cleaner has been applied with a clean, dry HP Splice Wipe or other white rag to remove cleaner residue prior to hot air welding.

#### C. Additional Membrane Securement

The membrane must be secured at the perimeter of each roof level, roof section, expansion joint, curb, skylight, interior wall, penthouse, etc., at any angle change which exceeds 2" per horizontal foot and at all other penetrations in accordance with Carlisle's published details.

#### D. Membrane Flashing

1. Flash all walls and curbs with Sure-Weld reinforced membrane. Non-Reinforced membrane shall be limited to inside and outside corners, field fabricated pipe seals, scuppers and Sealant Pockets where the use of pre-molded accessories are not practical. Terminate the flashing in accordance with an appropriate Carlisle Termination Detail.
2. On vertical surfaces, such as walls, curbs and pipes, Bonding Adhesive is not required when flashing height is 12" or less and membrane is terminated under a metal counterflashing (nailed). When a coping or termination bar is used for vertical terminations, Bonding Adhesive may be eliminated for flashing heights 18" or less.

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**Physical properties of Sure-Weld TPO Membrane can be referenced in Part II, "Products" of the Thermoplastic Specification.**

**Attach copies of the applicable Carlisle Details that pertain to the individual project to complete a bid package submittal.**